



GENÈVE, SUISSE
GENEVA, SWITZERLAND

POSTDOC POSITION AT CERN ON THE MCNET PROJECT

available January 1st 2007

MCnet is an EU-funded Marie Curie Research Training Network, dedicated to developing, validating, tuning and exploiting the next generation of Monte Carlo event generators, intended for use throughout the LHC and ILC era. It includes teams based in CERN, Durham, Karlsruhe and Lund, as well as a multinational ‘userlink’ team centred on University College London. It encompasses the Ariadne, Cedar, Herwig, Pythia, Sherpa and ThePEG projects.

The training objectives of MCnet are:

- (a) training a large section of the user base, using short-term residences of Early Stage Researchers as a conduit for transfer of knowledge into the wider community, and annual high-level schools on the physics and techniques of event generators; and
- (b) training the next generation of event generator authors through dedicated studentships and a small number of focused postdoc positions.

These will be achieved through dedicated activities and through the research activities:

- (c) developing the next generation of event generators intended for use throughout the lifetimes of the LHC and ILC experiments;
- (d) playing a central rôle in the analysis of early LHC data and the discovery of new particles and interactions there; and
- (e) extracting the maximum potential from existing data to constrain the modeling of the data from the LHC and other future experiments.

MCnet is funded for four years from January 1st 2007 and will have four two-year postdoc positions in total. **MCnet’s first postdoc position will be available at CERN from January 1st 2007. The closing date for applications is September 30th 2006.**

We are seeking applications from people who satisfy the criteria for a Marie Curie Experienced Researcher* with considerable experience of tuning or validating Monte Carlo event generators on experimental data and/or as an event generator developer.

The successful applicant will spend 80% of their time pursuing the goals of the MCnet project and are encouraged to develop their own research in theoretical, phenomenological or experimental particle physics in the remainder. They will be based in CERN’s Theoretical Physics group, but will work closely with members of CERN’s Physics Software group and the other network members, particular the CEDAR groups at University College London and Durham.

The precise programme of work will be defined according to the skills and experience of the successful applicant, but key tasks for the success of the network include:

- Becoming familiar with the CEDAR framework for validating and tuning event generators; implementing additional analyses and experimental results into CEDAR, particularly from Z^0 decays.
- Developing HepML I/O facilities for generators, for interoperability with other components (validation and tuning tools, GUI).

*More details can be found from the EU web site

http://ec.europa.eu/research/fp6/mariecurie-actions/action/training_en.html, but in brief: can have any nationality and, at the start of the contract: must hold a PhD, must have less than ten years research experience since the start of the PhD, must not have worked at CERN for more than 12 of the previous 36 months.

- Developing semi-automated systems for multiple parameter tuning to large data sets.
- Participating in the planning and running of the Annual School in Durham in April 2007.
- Developing hands-on exercises in the usage and implementation of event generator models for use in the Annual Schools and documented as a series of *Howto's* and maintained in the *Wiki* pages of the network.

Additional tasks more directly related to the development of event generator components could include:

- Developing a new model of underlying event physics based on the Jimmy model and implementing it into the Herwig++ event generator. Validating and tuning using Tevatron data.
- Improving the modeling and understanding of underlying-event physics in PYTHIA, in particular to model rescatterings of particles from the hard interaction. Validating and tuning using Tevatron data.
- Continuing the development, implementation and testing of a new algorithm for ‘multi-scale showering’ of events in which unstable particles are produced with decay widths comparable to the typical scale of parton showering.

The post will involve spending a considerable time visiting other teams of the network, particularly University College London, but there would be some flexibility as to whether this was for an extended period or a larger number of shorter trips.

More details can be obtained from the Network Project Manager, Mike Seymour (CERN), or from other members of the network:

Alberto Ribon (CERN)

Torbjörn Sjöstrand (CERN/Lund)

Peter Richardson (Durham team leader)

Frank Krauss (Durham)

Bryan Webber (Cambridge, a node of the Durham team)

Stefan Gieseke (Karlsruhe team leader)

Leif Lönnblad (Lund team leader)

Jon Butterworth (UCL, Userlink team leader).

Applications can be made online using CERN’s e-recruitment system: a link can be found on <http://seymour.web.cern.ch/seymour/mcnet/>. **All application materials, including letters of reference, must be received by September 30th 2006.** CERN hopes to make an offer immediately after the Marie Curie Steering Committee meeting on October 6th 2006, to start on January 1st 2007, or as soon as possible thereafter.

MCnet encourages applications from women, nationals of new EU member states and residents of Less-Favoured Regions.